as an air pipe, or an opening that is closed by means of a weathertight door or hatch cover. This opening does not include an opening closed by a—

(i) Watertight manhole cover;

(ii) Flush scuttle;

(iii) Small watertight cargo tank hatch cover that maintains the high integrity of the deck;

(iv) Class 1 door in a watertight bulkhead within the superstructure;

(v) Remotely operated sliding watertight door; or

(vi) Side scuttle of the non-opening type.

(2) *Heel angle.* The maximum angle of heel must not exceed 25 degrees, except that this angle may be increased to 30 degrees if no deck edge immersion occurs.

(3) *Range of stability.* Through an angle of 20 degrees beyond its position of equilibrium after flooding, a tank vessel must meet the following conditions:

(i) The righting arm curve must be positive.

(ii) The maximum righting arm must be at least 3.94 inches (10 cm).

(iii) Each submerged opening must be weathertight.

(4) *Progressive flooding.* Pipes, ducts or tunnels within the assumed extent of damage must be either—

(i) Equipped with arrangements such as stop check valves to prevent progressive flooding to other spaces with which they connect; or

(ii) Assumed in the design calculations required in paragraph (b) of this section to permit progressive flooding to the spaces with which they connect.

(h) *Buoyancy of superstructure.* For the purpose of paragraph (b) of this section, the buoyancy of any superstructure directly above the side damage is to be disregarded. The unflooded parts of superstructures beyond the extent of damage may be taken into consideration if they are separated from the damaged space by watertight bulkheads and no progressive flooding of these intact spaces takes place.

TABLE 172.065(a)—EXTENT OF DAMAGE

COLLISION PENETRATION	
Longitudinal extent	$0.495L^{2/3}$ or 47.6 feet ($(1/3)L^{2/3}$ or 14.5m) whichever is shorter.
Transverse extent[1]	B/5 or 37.74 feet (11.5m) which is shorter.
Vertical extent	From the baseline upward without limit.
GROUNDING PENETRATION AT THE FORWARD END BUT EXCLUDING ANY DAMAGE AFT OF A POINT 0.3L AFT OF THE FORWARD PERPENDICULAR	
Longitudinal extent	$0.495L^{2/3}$ or 47.6 feet ($(1/3)L^{2/3}$ or 14.5m) whichever is shorter.
Transverse extent	B/6 or 32.81 feet (10m) whichever is shorter but not less than 16.41 feet (5m).
Vertical extent from the baseline.	B/15 or 19.7 feet (6m) whichever is shorter.
GROUNDING PENETRATION AT ANY OTHER LONGITUDINAL POSITION	
Longitudinal extent	L/10 or 16.41 feet (5m) whichever is shorter.
Transverse extent	16.41 feet (5m).
Vertical extent from the baseline.	B/15 or 19.7 feet (6m) whichever is shorter.

[1] Damage applied inboard from the vessel's side at right angles to the centerline at the level of the summer load line assigned under Subchapter E of this chapter.

TABLE 172.065(b)—PERMEABILITY

Spaces and tanks	Permeability (percent)
Storeroom spaces	60.
Accommodation spaces	95.
Voids	95.
Consumable liquid tanks	95 or 0.[1]
Other liquid tanks	95 or 0.[2]

[1] Whichever results in the more disabling condition.

[2] If tanks are partially filled, the permeability must be determined from the actual density and amount of liquid carried.

Subpart E—Special Rules Pertaining to a Barge That Carries a Hazardous Liquid Regulated Under Subchapter O of This Chapter

§ 172.080 Specific applicability.

This subpart applies to each tank barge that carries a cargo listed in Table 151.01–10(b) of this chapter.

§ 172.085 Hull type.

If a cargo listed in Table 151.05 of part 151 of this chapter is to be carried, the tank barge must be at least the hull type specified in Table 151.05 of this chapter for that cargo.

§ 172.087 Cargo loading assumptions.

(a) The calculations required in this subpart must must be done for cargo weights and densities up to and including the maximum that is to be endorsed on the Certificate of Inspection